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A new locality for the rare Guerreran Centipede Snake, *Tantilla coronadoi* Hartweg, 1944 (Squamata, Colubridae), with comments on morphological variation

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Abstract

We record the third known specimen of *Tantilla coronadoi* Hartweg, 1944 from Guerrero, Mexico. Our new record extends this species' distribution by 90 km and to a new Mexican biogeographic province (Balsas Basin). The morphological similarity between this and the two previously known specimens supports the validity of the taxon, and otherwise points to the possible presence of an undescribed taxon on the coast of Guerrero. Additional fieldwork yielding a larger series of this and other infrequently encountered species may enable a better understanding of their distribution, natural history, ecology, and conservation.

Keywords

Guerrero, Balsas Basin, morphological description, centipede snakes

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Introduction

The genus *Tantilla* Baird & Girard, 1853 comprises 67 species of snakes in the family Colubridae, making it one of the most diverse snake genera in the Western Hemisphere. Currently, 31 species are known to occur in Mexico, which is regarded as a center of diversification for the genus (Wilson 1999; Wilson and Mata-Silva 2014). Snakes in the genus *Tantilla* are mostly small-bodied with fossorial or semifossorial habits. Wilson and Meyer (1981) designated the *calamarina* group to encompass four species—*T. calamarina* Cope, 1876, *T. cascadae* Wilson & Meyer, 1981, *T. coronadoi* Hartweg, 1944, and *T. deppei* (Bocourt, 1883)—united by traits in their coloration such as a spatulate head pattern and the presence of a dark dorsal stripe occupying the center of the middorsal scale row. Furthermore, four additional species—*T. ceboruca* Canseco-Márquez et al., 2007, *T.*

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sertula Wilson & Campbell, 2000, and *T. vermiformis* (Hallowell, 1861)—were considered within the group (Wilson and Mata-Silva 2014, 2015). Species of the *calamarina* group are distributed along the Pacific versant from Nayarit, Mexico (*T. ceboruca*) to as far south as El Salvador and northwestern Costa Rica (*T. vermiformis*) (Wilson 1999; Canseco-Márquez et al. 2007; Wilson and Mata-Silva 2014, 2015). Except for *T. vermiformis*, the entire group is restricted to Mexico.

Tantilla coronadoi (Guerreran Centipede Snake) is a member of the *calamarina* group and endemic to the Mexican state of Guerrero. It is only known from two specimens, the first individual (the holotype) collected by W.W. Brown in the vicinity of Chilpancingo sometime before 1944 (Hartweg 1944; UMMZ 85697), and a second individual collected by Ralph W. Axtell from a locality listed as "3 mi W of Chilpancingo" on 17 June 1953 (Davis and Dixon 1959; TCWC 9528). Herein, we newly report a third locality from the Balsas Basin in Guerrero, which also represents the first documentation of *T. coronadoi* after a 68-year hiatus. Our new record extends the range of *T. coronadoi* by over 90 km to the northeast of the closest known locality, represents the lowest known elevation for the species, and confirms its presence in a new biogeographic province.

Methods

Field surveys have been conducted in the Alto Balsas region of Guerrero, Mexico, by us on a regular basis since April 2007. The specimens collected were euthanized with sodium pentobarbital, fixed with 10% formalin, and preserved in 70% ethanol for permanent storage. The specimen of *Tantilla coronadoi* was deposited at the herpetological collection of the Museo de Zoología "Alfonso L. Herrera", Facultad de Ciencias, Universidad Nacional Autónoma de México (MZFC). Specimen identification was verified by (1) direct comparison with representatives of the genus deposited at the MZFC and the Colección Nacional de Anfibios y Reptiles, Universidad Nacional Autónoma de México (CNAR); and (2) data provided in the descriptions of *T. coronadoi* by Hartweg (1944) and Wilson and Mata-Silva (2014). The color pattern was described after 10 years in preservative using the color codes defined by Köhler (2012).

Results

Tantilla coronadoi Hartweg, 1944

Figure 1

New record. MEXICO – **Guerrero** • Copalillo, 2.5 km NE of Papalutla; 18°01′37.41″N, 098°51′54.11″W; 650 m elevation; 11.XI.2007; Samuel A. Santa Cruz Padilla leg.; under rock in a sandy area on the bank of the Atoyac River, with surrounding vegetation represented by tropical deciduous forest; 1 ♀ adult, MZFC 25507.

Description. An adult female, total length 161 mm, tail length 25 mm and tail/total length ratio 0.155. The scutellation consists of 15 dorsal scale rows, all scales smooth; 178 ventral scales; anal plate divided; 41 paired subcaudal scales + cornified caudal tip; 7 supralabial scales on both sides; 6 infralabial scales; 1+1 temporal scales; 2 postocular scales; postnasal scales in contact with the preocular scales on both sides; first pair of infralabial scales separated by the mental scale, first to fourth contacting anterior pair of chinshields; third and fourth supralabial scales contacting the orbit; and seventh supralabial in contact with the parietal scale. Coloration after 10 years in preservative consists of two lateral dark stripes on dorsal scale rows 3 and 4 that are continuous along the body, a thin black dorsal line on dorsal scale row 8 (the middorsal row), a brown marking on the nape, and five thinner lines on scale rows 5–7 between the lateral stripes and the dorsal line. The background color of the body is smoke gray (266), with the marking on the nape being Prout's brown (47) and burnt amber (48) at the margins. Lateral lines are amber (51), dashing on both sides near the ventral scales and not covering the total area of the scales, mixing slightly with the ground color. The dorsal line is black, with the color being most conspicuous on the scale tips and diffuse on the rest of the scales; fine lines as dashes at the scale tips present between the laterals and dorsal lines. The venter is immaculate cream white (52). Our specimen differs from the two pre-existing specimens (measurements of our specimen vs male and female, respectively) of *T. coronadoi* in having a higher number of ventral scales (178 vs. 158, 165), a higher number of subcaudal scales (41 vs. 35, 40), and a smaller tail/length ratio (0.155 vs. 0.164, 0.169); otherwise, it agrees well with the original

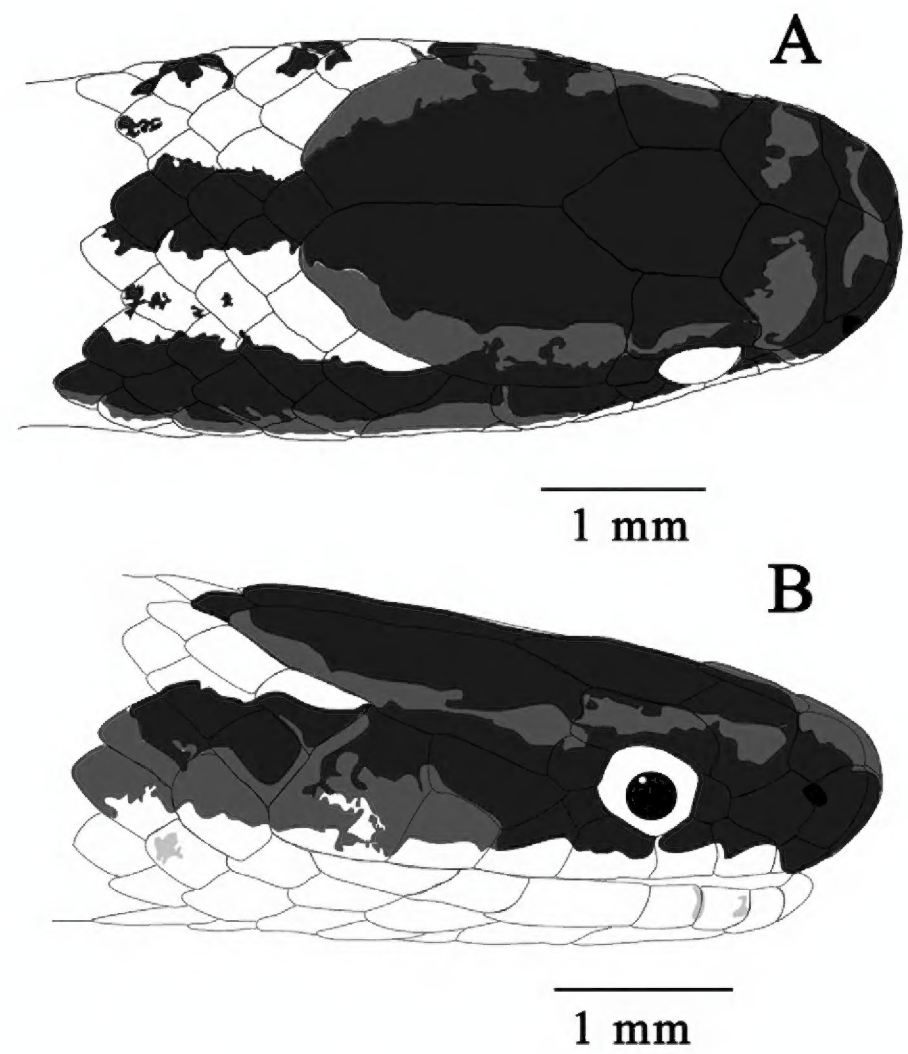

Figure 1. Diagrammatic illustration of *Tantilla coronadoi* (MZFC 25507) head. **A**. Dorsal and **B**. Lateral views.

diagnosis of the species.

Identification. The specimen (MZFC 25507) is identified as *T. coronadoi* based on the following characters: a dark middorsal stripe confined to the middorsal scale row; dark lateral stripes on rows 3 and 4; 15-15-15 dorsal scale rows; seven supralabials, the seventh in contact with the parietals, separating anterior temporal from the posterior one (Fig. 1); and two postoculars.

Discussion

Our new record extends the known distribution of *T. coronadoi* by some 90 km northeast from the type locality near the city of Chilpancingo (Hartweg 1944; Fig. 2). This third locality is about 7 km southwest of the border between the states of Guerrero and Puebla, and our field observations of habitat continuity suggest that future fieldwork is likely to reveal the presence of *T. coronadoi* in the state of Puebla. Our new record also extends the known lower elevation limit posited by Wilson (1990) at around 1400 m to 650 m, a difference of 750 m.

In their taxonomic treatment of the genus, Wilson and Mata-Silva (2014) mentioned the existence of a specimen of *Tantilla* from Tecoanapa, Guerrero, in the Pacific lowlands collected by Hans Gadow in 1904. This female specimen (BMNH 1906.6.1.241) apparently shows "intermediate" characters which led these authors to hypothesize a close relationship between *T. coronadoi* and *T. cascadae*. These characters include the anterior and posterior temporal scales not separated by the seventh supralabial scale; an incomplete dark lateral stripe (like in *T. cascadae*); 156 ventral scales, and seven supralabial scales (similar to the holotype of *T. coronadoi*). The authors concluded that this specimen is either a representative of *T. coronadoi* or a closely related unnamed taxon. We support the latter opinion, since our female specimen exhibits 178 ventral scales, similar to the only known *T. coronadoi* female (165), the invariable diagnostic feature of the seventh supralabial scale in contact with the parietal scale, and a pattern of continuous lateral dark stripes. Therefore, *T. coronadoi* is now known from two biogeographic provinces: the dry, mid-elevation reaches of the central Sierra Madre del Sur, and the dry forest of the Balsas Basin in northeastern Guerrero (Morrone 2020), across an elevation range of 650–1524 m. Both provinces stand out for supporting a high number of endemic species, indicating diversification processes possibly associated with the great topographic variation of the region, as has been suggested in other groups (e.g., anurans: Campbell et al. 2018; squamates: Palacios-Aguilar and Flores Villela 2018; birds: Vázquez-Reyes et al. 2018).

Tantilla coronadoi remains a "rare" species known from three specimens, including the one described here, and in over 10 years of fieldwork conducted by us in the surroundings of Chilpancingo and the locality reported here near Papalutla, no other specimen has been collected. Myers (2003) summarized three main issues that

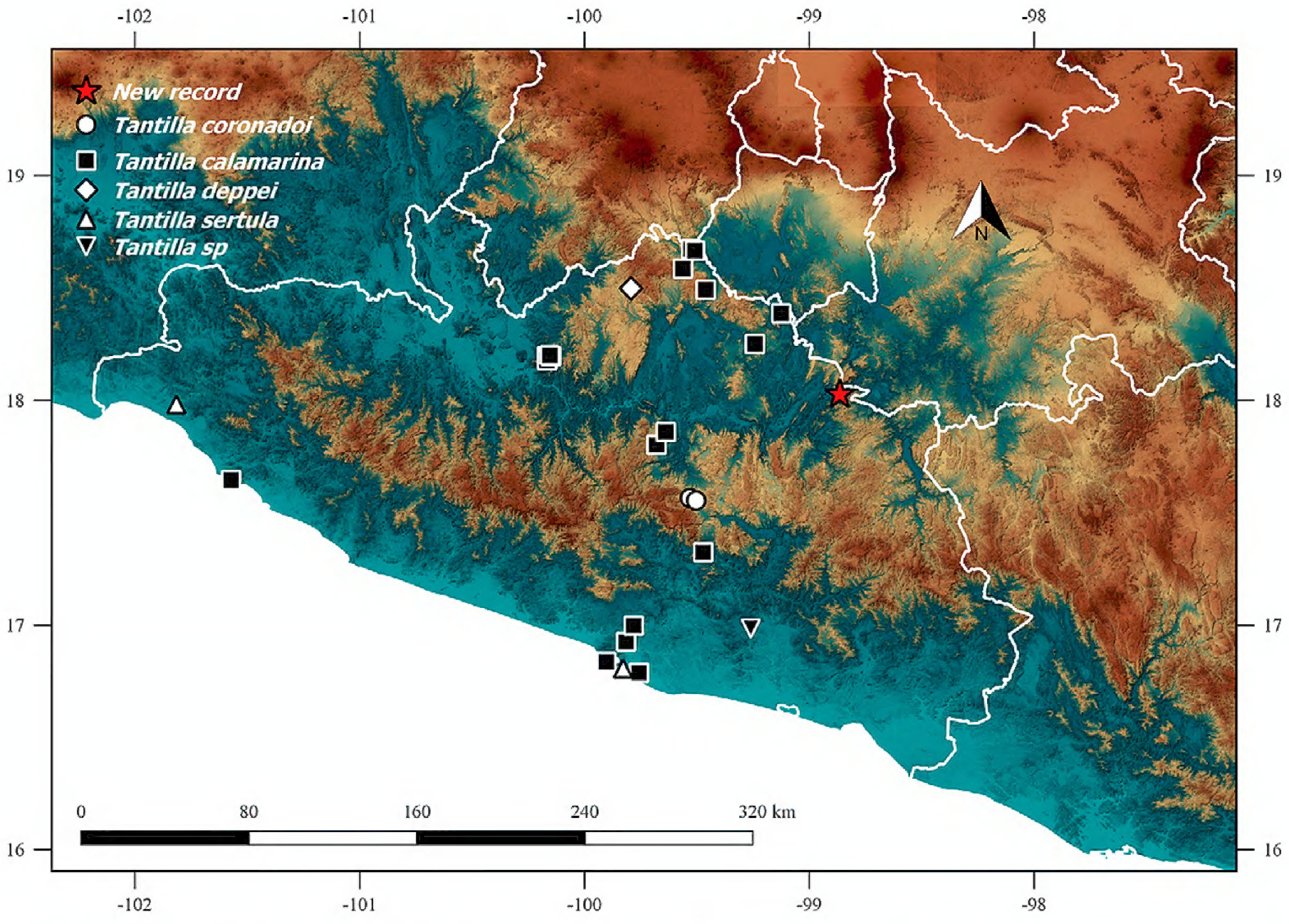

Figure 2. Geographic distribution of the *Tantilla calamarina* species group in Guerrero, Mexico. The red star represents our new record of *T. coronadoi* near Papalutla, and the *Tantilla* sp. record refers to the specimen discussed by Wilson and Mata-Silva (2014) (BMNH 1906.6.1.241).

contribute to the rarity or "appearance of rarity" of wet tropical forest-dwelling snakes: (1) low population densities; (2) secretive habitats; and (3) small geographic ranges and/or specialized microhabitat. In the case of *T. coronadoi*, the enigmatic nature of this species seems to be a combination of these three factors, especially the latter two. Aside from *T. calamarina* itself, *Tantilla* specimens of the clade comprising the *calamarina* group are scarce in collections (Ramírez-Bautista et al., 2014). However, in recent decades a few new Mexican specimens of *T. cascadae*, *T. ceboruca* (Cruz-Saenz et al. 2015), and *T. sertula* (Canseco-Márquez et al. 2007a; Rocha et al. 2016) have been reported in the scientific literature, increasing our knowledge of the geographic distribution of these elusive snakes. We hope that additional fieldwork will produce larger series of these and other infrequently encountered species of snakes that might enable us to better understand aspects of their natural history, ecology, geographic distribution, and conservation, as well as to resolve the taxonomic status of ill-defined taxa. Despite its rarity, conservation schemes such as the Mexican legislation and the International Union for the Conservation of Nature lists *T. coronadoi* under their lowermost categories: Pr (special protection) and LC (least concern) (SEMARNAT 2010; Canseco-Márquez et al. 2007b), contrary to the Environmental Vulnerability Score (EVS) which place it under the higher vulnerability category (Palacios-Aguilar and Flores-Villela 2018). Given the new locality reported here, the EVS score of *T. coronadoi* should be modified as follows: 5 + 7 + 2 = 14 (Wilson et al. 2013).

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Authors' Contributions

Conceptualization: VHJA, RPA. Data curation: VHJA, RPA. Formal analysis: RPA. Methodology: VHJA, RPA, SASCP. Resources: SASCP, VHJA. Writing – original draft: SASCP, RPA, VHJA. Writing – review and editing: RPA, VHJA, SASCP.

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